Lean Project Management

- A Proven Method for Dramatically Improving Project Performance -

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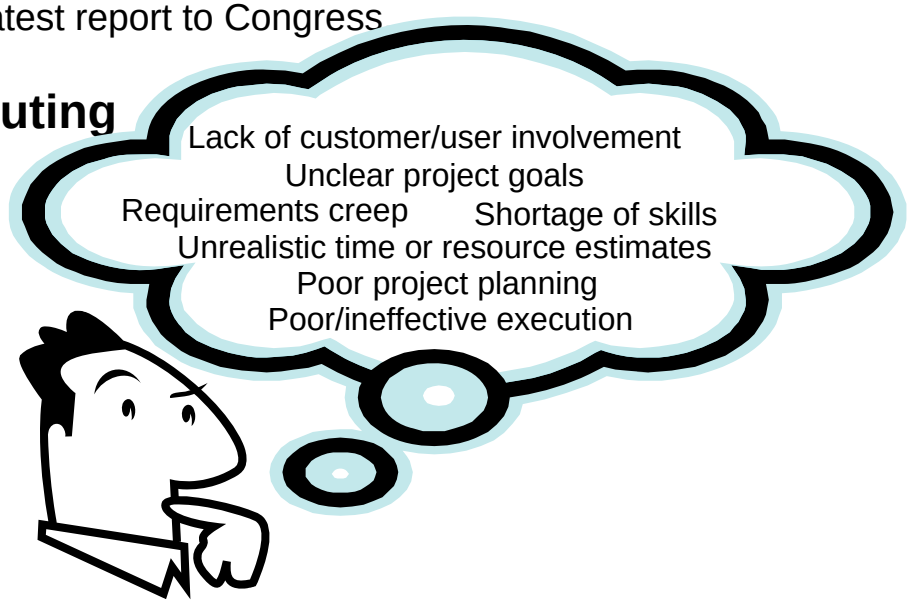
Discussion Topics

- **The Problem with Projects**
- **The Program Manager's Dilemma**
- **Project Management Methods Are Presumed Effective**
- **Planning & Execution Drive Project Performance**
- **When Projects Fail, Everyone Loses**
- **Lean Project Management - A Different Focus**
- **LPM Planning, Execution, and Monitoring & Control**
- **Team Support - Critical To Success**
- **Summary & Conclusions**
- **Q&A**

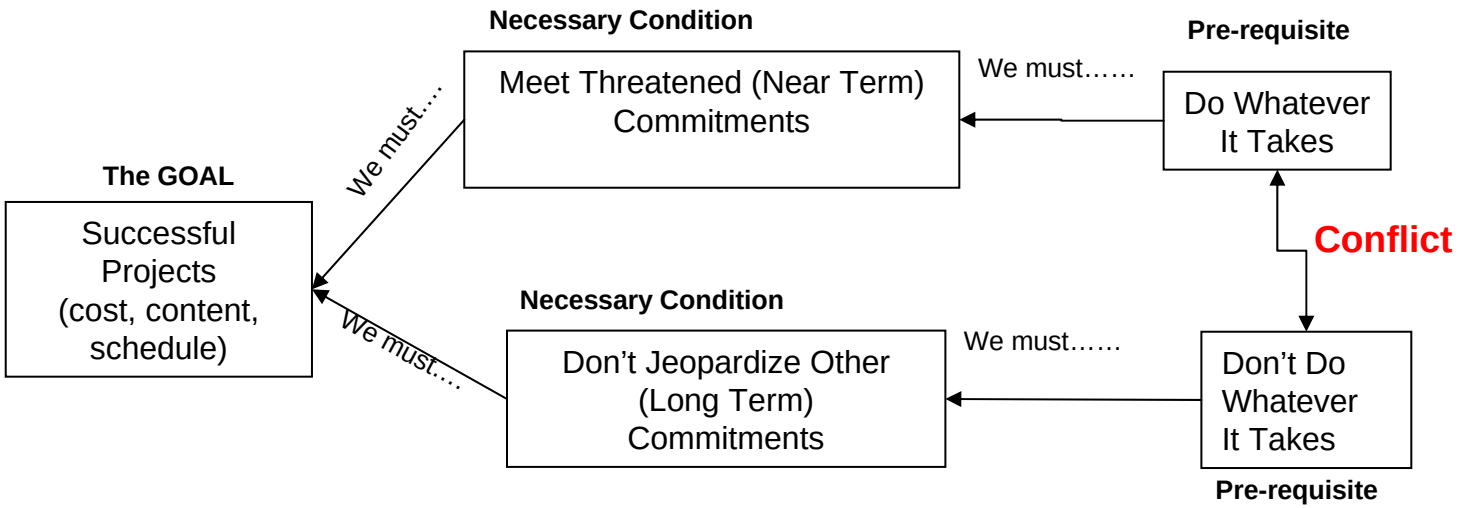
The Problem with Projects

- **Industry Data Shows a Majority of Projects Fail to Deliver**
  - "62 percent of IT projects fail." *CNET News, March 21, 2008*
    - 49 percent suffer budget overruns
    - 47 percent had higher-than-expected maintenance costs, and
    - 41 percent failed to deliver the expected business value and ROI
- **We Are Not Immune and Must Do Better**
  - "Major NASA projects over budget", *USA Today, March 26, 2008*
    - Two-thirds of NASA's major new programs are significantly over budget or behind schedule according to the agency's latest report to Congress
- **Myriad of Factors Cited as Contributing to Project Failures**



The Program Manager's Dilemma: Variation

- When a new project arrives or a change occurs to an existing project, managers face a dilemma:



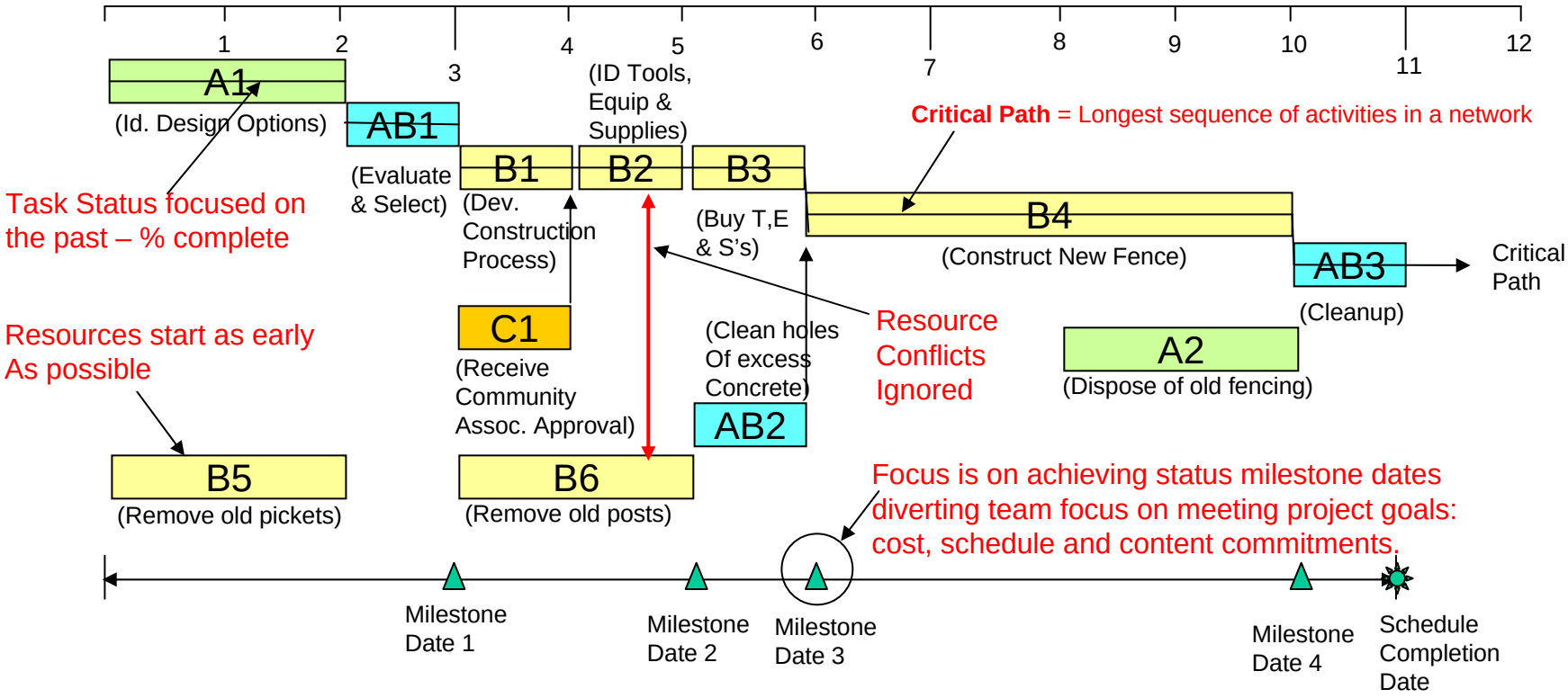
- The PM's response to normal project variation affects:
  - Team behaviors
  - Project planning and execution
  - Performance on both current and future projects

Current Project Management Methods Are Presumed Effective

- **How Well Do Current Practices Manage Project Variation?**
  - **Project Planning**
    - Assumes unlimited resource/skill availability
    - Task duration estimates are treated as deterministic once scheduled
  - **Execution**
    - Tasks are started as soon as possible
    - Focus is on progress status milestones
  - **Monitoring & Control**
    - Project status measured on percent complete

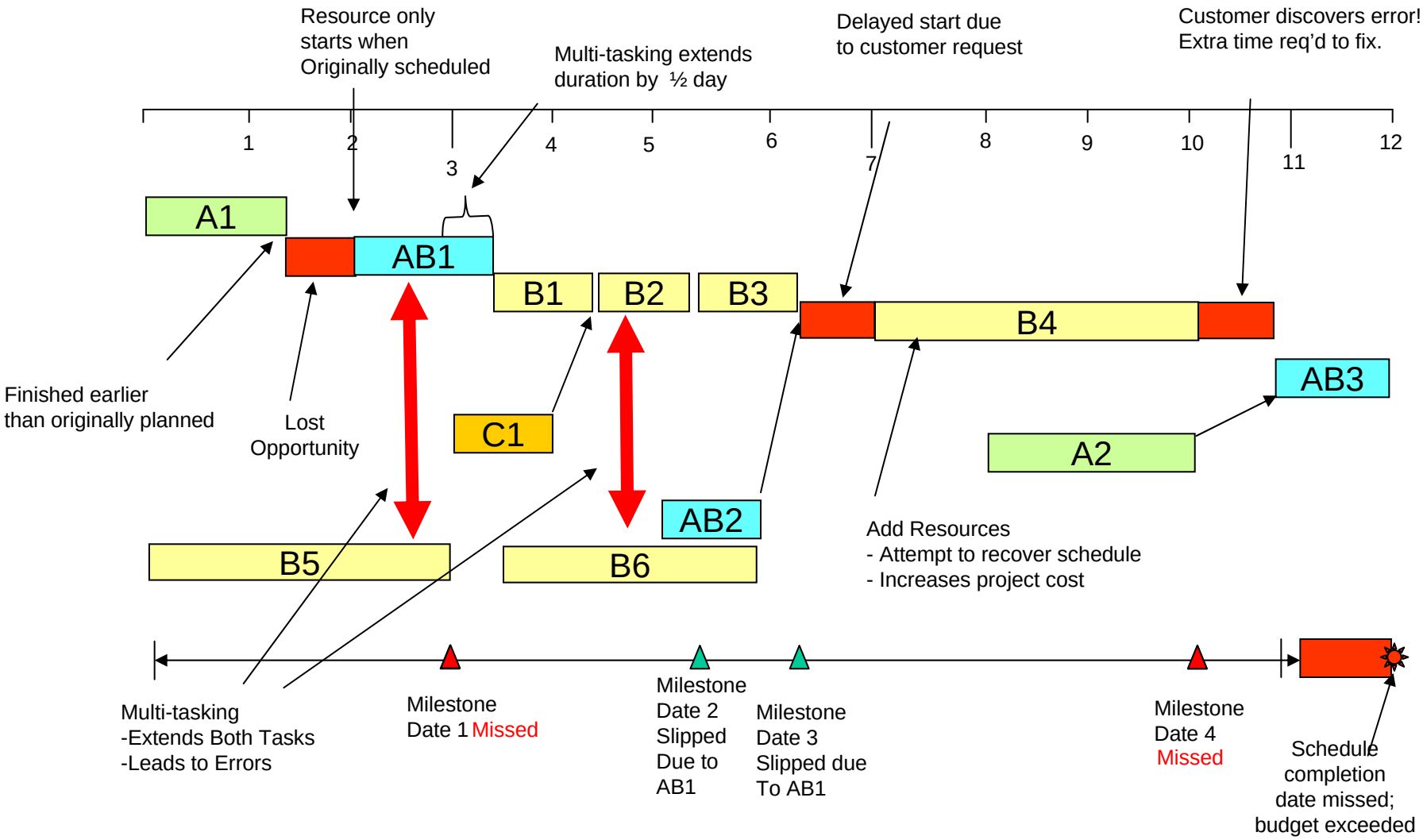
A Simple Fence Building Project Example

- **Legend**
  - Each letter/color combination represents a different resource/skill
  - The numbers represent the specific number for a task



Longest String of Dependent Tasks = Critical Path: e.g. 11 weeks

A Simple Fence Building Project Example



When Projects Fail, Everyone Loses

- **Customers**
  - Do not receive the products or services promised within cost and/or schedule
  - In an attempt to control variability next time, customer's add more oversight
- **Contracted Suppliers**
  - Customer relationship and corporate profits negatively impacted
  - In an attempt to control variability next time, supplier's add more oversight
- **Project Managers**
  - Relationship with internal and external customers and team members negatively impacted
  - In an attempt to control variability next time, PM's add more detail into their schedules
- **Team Members**
  - Strained relationships with Program Office personnel
  - Exhausted from multi-tasking, demoralized and frustrated for having failed
  - In an attempt to control variability next time, team members add safety margin to their task estimates

Actions intended to improve project performance, mask the root cause - project variation

Lean Project Management - A Different Focus

- **Every Project's Goal**
  - Should be to deliver a quality product or service as soon as possible while staying within the customer's budget.

- **"Any project worth doing, is worth doing….FAST!"** *Larry Leach*
  - Until the project is finished the customer does not receive any value.

- **Projects that complete on time using LPM methods satisfy the other two necessary conditions of cost and content.**

- **Organizations that have adopted lean project management practices show greatly improved performance**
  - The majority go from being 90% late to 90% on-time or early.

LPM is Based On The Theory of Constraints

- **The Theory of Constraints is a management philosophy developed by Dr. Eliyohu M. Goldratt which states:**
  - Everything exists as part of some system
  - Every system has one key constraint holding it back
  - For projects, task variability is the key constraint
- **LPM takes a Systems Approach to Project Management**
  - Team Focus on project goal
  - Relay race model for project planning, execution and monitoring & control

Lean Project Management - Planning

- **Right to left – Keep the End In Mind**
  - Work backwards – Identify essential inputs for each task in network
  - **Benefits**:
    - Facilitates identification of the minimum number of essential inputs for each task
    - Reduces unnecessary schedule detail
- **Decision Milestones**
  - Include minimum number of milestones in the schedule
  - **Benefits:**
    - Eliminates unnecessary “progress” status milestone meetings
    - Maintains team focus
- **Aggressive Task Estimates**
  - Tasks are planned with a 50% probability of completing within the estimated duration.
  - **Benefit**:
    - Preserves ability to complete project sooner

Lean Project Management – Planning (cont.)

- **Resolve Resource Contention**
  - Most constrained task/resources are identified (referred to as the Critical Chain) and given top priority
  - **Benefit:**
    - Eliminates task/resource contention within the project

- **Common Safety Margin Pool**
  - Individual task safety margins are shared and used as needed by the team
  - **Benefits**:
    - Facilitates teamwork
    - Easy to determine project margin status

- **Critical Chain Protection**
  - Non-critical chain tasks have individual safety buffers to protect critical chain
  - **Benefits:**
    - Minimizes disruption to critical chain

Lean Project Management - Execution

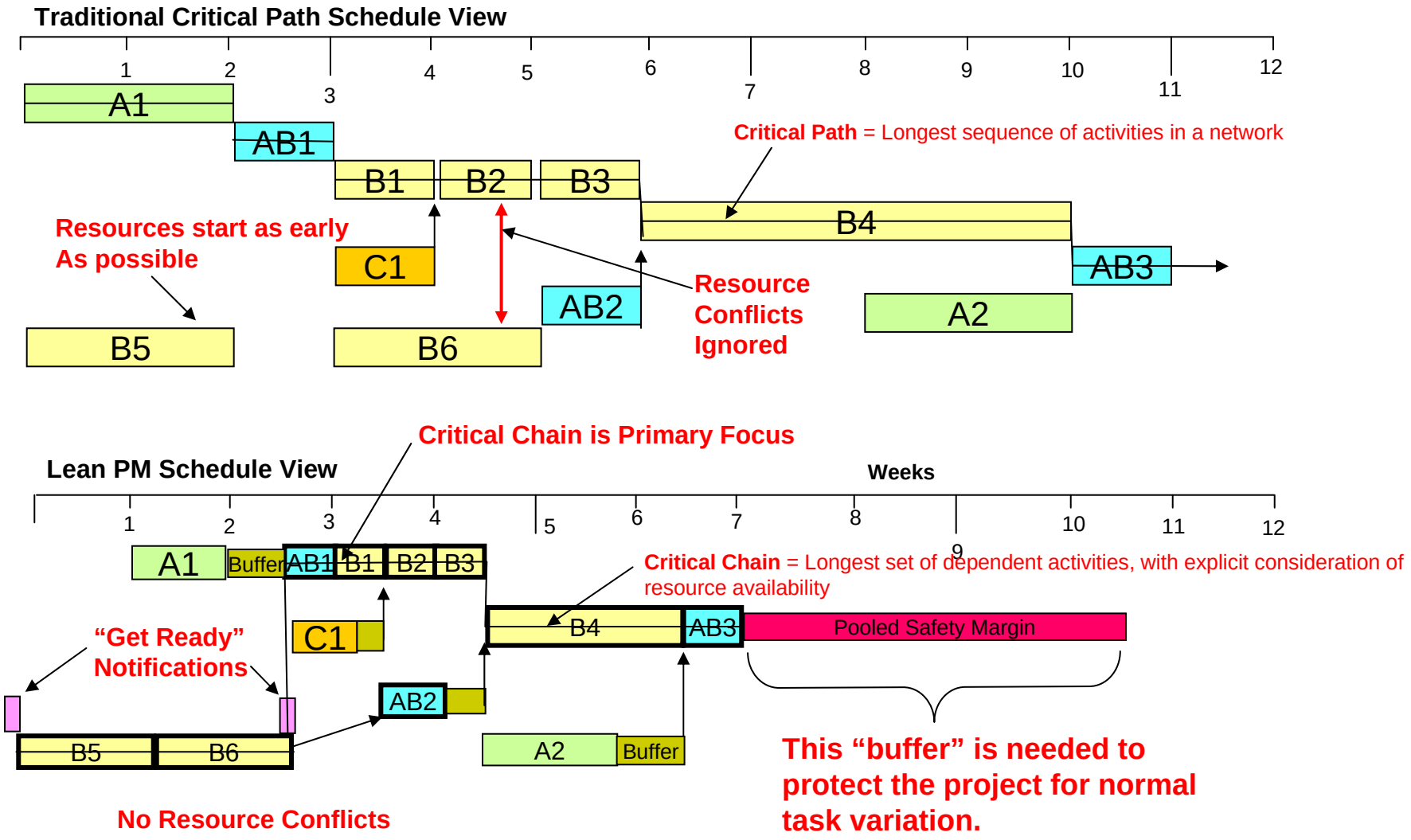
- **Focus is on the Critical Chain**
  - Resources on the critical chain are the “runners” that determine project completion
  - Non-critical chain tasks and resources are subordinated
  - **Benefits**:
    - Ensures focus is on those tasks and resources that determine project completion
    - Focuses team on project, not individual task performance

- **Bad Multi-Tasking is Eliminated**
  - Bad multi-tasking occurs when team members switch between tasks before either completing the task or coming to a natural stopping point.
  - Execution rules are established to focus resources
  - **Benefits**:
    - Team members are less stressed and more productive
    - Resources complete their tasks quicker, accelerating entire project
    - Uncovers previously “hidden” capacity within the team

Lean Project Management – Execution (Cont.)

- **"Full Kit" Review**
  - Conducted to insure all of the essential inputs are available and of proper quality before starting major section of project
  - **Benefits:**
    - Reduces rework
- **Tasks Start as Late as Possible**
  - Tasks do not start until all of the required information is available
  - **Benefits**:
    - Frees up resources for other projects
    - Prevents rework due to incomplete or incorrect preliminary inputs
    - Reduces chaos in the system caused by having more resources working concurrently than needed
    - Reduces costs
- **"Get Ready (to run)" Notifications**
  - Resources receive advance notification to get ready to execute their tasks
  - **Benefits:**
    - Optimizes use of the organizations resources
    - Ensures tasks are started on time

Traditional vs. Lean Project Management Comparison



Lean Project Management – Monitoring & Control

- **Forward Focus Status Reporting**
  - Between team meetings, team members provide the following task status:
    1. Task is complete
    2. Task has not started
    3. Task is in work. For tasks in work, answers to the following questions are provided:
       a) What is the work remaining?
       b) How much time is needed to complete the remaining work?
       c) What could hold you up?
  - **Benefits**:
    - More effective weekly team meetings
    - Team maintains forward focus to identify potential risks to their work plans

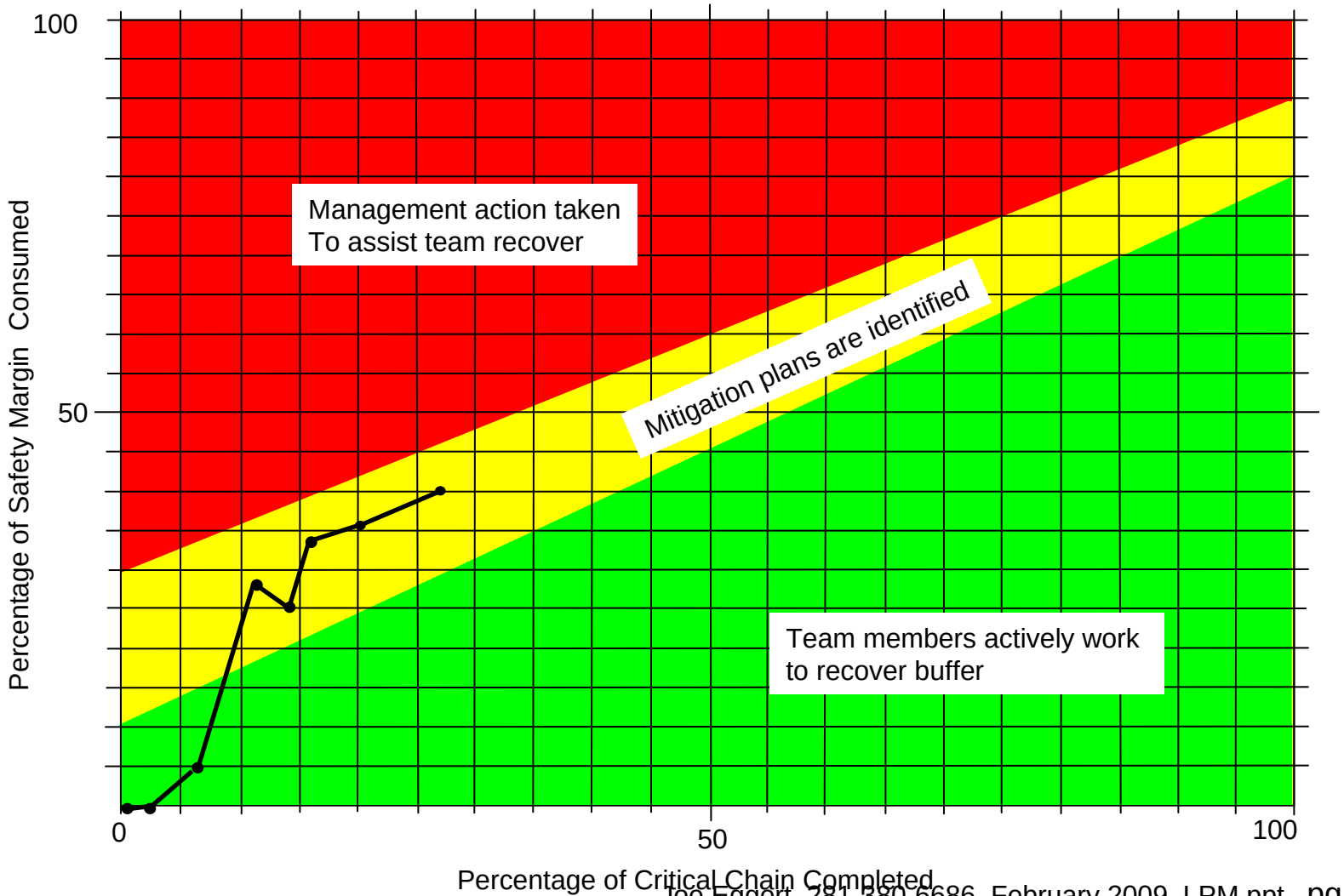
- **Lean Team Meetings**
  - Used discuss mitigation plans and team recovery action plans
  - **Benefits**:
    - Quick, simple and short meetings, freeing up resources and reducing cost

Lean Project Management – Monitoring & Control (cont.)

- **Buffer Management – The Main Metric**
  - Schedule margin consumption rate vs. progress along the critical chain
  - Type of corrective action based on the relative status of this metric
  - **Benefits**:
    - Greatly simplifies management of the project
    - Easy to compare status across projects
    - Predictive metric
    - Focuses team on project status, encouraging team work and ownership

Lean Project Management Project Buffer Status Report

- **Percentage Project Buffer Consumed vs. Percent CC Complete**



Team Support Is Critical To Success

- **Boeing's Space Exploration LPM projects included active support from:**
  - **Program Management**
  - **Project Managers / Engineers**
  - **Functional Managers**
  - **Technical Leads**
  - **Business Management**
  - **Contracts**
  - **Procurement**
  - **Plus over 75 personnel from engineering, business management, contracts and procurement as well as outside vendors have been involved with our projects.**

Summary & Conclusion

- **Projects Often Fail To Meet Customer Expectations**
- **Variability Is The Key Project Management Constraint**
- **Traditional Project Management Methods Are Ineffective In Managing Variability**
- **Lean Project Management Provides A Different Focus**
- **LPM Planning, Execution and Monitoring & Control Manage Task Variability**
- **Team Support Is Critical To Success**
- **Lean Project Management Offers NASA and Its Contractors An Unprecedented Opportunity To Dramatically Improve Project Performance**

Questions?